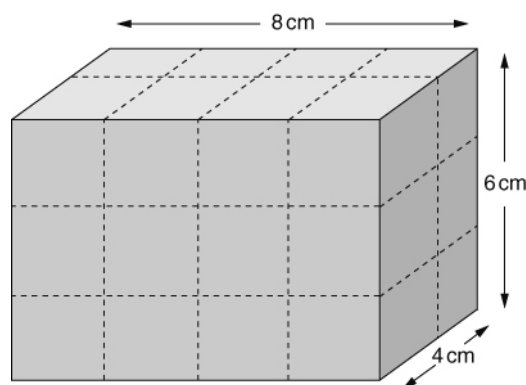


Name _____ Class _____ Date _____

The block in the diagram represents a lump of food. The lines show how it could be divided into smaller blocks.



- 1 Calculate the surface area of the big block. Show all your working.
- 2 The block is cut into smaller blocks along the lines. How many smaller blocks will there be?
- 3 Calculate the surface area of one of the small blocks. Show all your working.
- 4 Calculate the surface area of all the small blocks together. Show all your working.
- 5 Explain why teeth are important for the digestion of food. Use ideas about surface area in your answer.
- 6 The small intestine is a tube that is about 6.5 m long with a diameter of about 2.5 cm. A tube of these dimensions has a surface area of 0.51 m^2 .
 - a The small intestine is covered in villi. They increase the surface area by 20 times. The villi cells are covered in microvilli, which increase the surface area by another 20 times. Work out the total surface area of the small intestine with villi and microvilli. Show your working.
 - b Explain why it is important for the small intestine to have a large surface area.
 - c The surface area is actually larger than the figure you calculated. In what other way is the surface area of the small intestine increased?
 - d The small intestine of an elephant is 21 m long. Estimate its surface area.
 - e What assumptions have you made in calculating this estimate?

I can...

- calculate surface areas of cuboids
- explain the importance of surface area in digestion and absorption.